

WE CLAIM AS OUR INVENTION:

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1. An arrangement for data follow-up for a warmup cycle of an ink jet printhead, said arrangement comprising:

an ink cartridge having an ink jet printhead and a drive unit connected to the ink jet printhead for heating, measuring a temperature of, and driving the ink jet printhead;

a control unit connected to the drive unit for controlling the drive unit;

a memory accessible by said control unit having a first memory area in which warmup data are stored in re-writable fashion, and a second memory area in which data representing at least one predetermined condition are stored, said at least one predetermined condition being selected from the group consisting of temperature-related conditions, history-related conditions and user-related conditions;

a sensor connected to said drive unit for measurement of ambient temperature; and

said control unit being programmed to implement at least one measurement of said ambient temperature with said sensor, and to determine warmup data for a fast start for a current warmup cycle dependent upon said ambient temperature and dependent on said at least one predetermined condition.

2. An arrangement as claimed in Claim 1, said memory is a first memory, and wherein said arrangement comprises:

a second memory disposed on said ink cartridge, and which identification data uniquely identifying said ink cartridge, and data

representing further predetermined conditions, are store, and wherein said warmup data stored in said first memory are allocated to said identification data.

3. An arrangement as claimed in Claim 2 wherein said ink cartridge has a serial number uniquely associated therewith, and wherein said identification data includes said serial number.

4. An arrangement as claimed in Claim 2 wherein said ink cartridge has a manufacturer identification number uniquely associated therewith, and wherein said identification data includes said manufacturer identification number.

5. An arrangement as claimed in Claim 2 wherein said ink cartridge has a serial number and a manufacturer identification number uniquely associated therewith, and wherein said control unit comprises a security module for forming a code word by encryption of said serial number and said manufacturer identification number, and wherein said control unit stores said code word in said second memory as at least a portion of said identification data.

6. An arrangement as claimed in Claim 1 wherein said memory is disposed on said ink cartridge and wherein said second memory area additionally contains identification data uniquely identifying said ink cartridge, and data representing further predetermined conditions allocated to said identification data, and where in said control unit is programmed to interrogate said memory to execute said data followup employing said further predetermined conditions allocated to said identification data.

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7. An arrangement as claimed in Claim 6 wherein said ink cartridge has a serial number uniquely associated therewith, and wherein said identification data includes said serial number.

8. An arrangement as claimed in Claim 6 wherein said ink cartridge has a manufacturer identification number uniquely associated therewith, and wherein said identification data includes said manufacturer identification number.

9. An arrangement as claimed in Claim 6 wherein said ink cartridge has a serial number and a manufacturer identification number uniquely associated therewith, and wherein said control unit comprises a security module for forming a code word by encryption of said serial number and said manufacturer identification number, and wherein said control unit stores said code word in said second memory as at least a portion of said identification data.

10. An arrangement as claimed in Claim 1 wherein said drive unit includes a sensor for measuring the temperature of the ink jet printhead, said sensor generating sensor data representing said temperature, and wherein said control unit is programmed to interrogate said sensor data via said drive unit for determining said warmup data.

11. An arrangement as claimed in Claim 1 comprising:

a user interface connected to said control unit for entering a user request for said fast start;

a communication link, connected to said control unit, to a remotely disposed telepostage data center which, upon receipt of said user request, transmits a parameter for said fast start, including an identification of said user, to said control unit, and wherein said control unit is programmed to store

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said parameter in said memory and to employ said user related conditions, corresponding to the user identified by said parameter, for determining said warmup data for said fast start.

12. An arrangement as claimed in Claim 1 further comprising a date clock module connected to said control unit for generating history-related data as said history-related conditions .

13. A method for determining data for a warmup cycle of an ink jet printhead before operating said ink jet printhead comprising the steps of:

storing warmup data and data representing a first condition in a memory of an apparatus employing an ink jet printhead upon installation of an ink cartridge for said ink jet printhead in said apparatus, before a first use of said newly installed ink cartridge;

accumulating and storing parameter data for second conditions for a fast start of said ink jet print head during repeated use of said ink jet printhead; and

determining warmup data for said second conditions from said parameter data and employing said warmup data for said second conditions in at least one warmup cycle of said ink jet printhead.

14. A method as claimed in Claim 13 wherein the step of storing said parameter data comprises storing said parameter data in a table, and wherein the step of determining said warmup data comprises the electronically accessing said table to retrieve said parameter data therefrom, and determining said warmup data from said retrieved data.

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15. A method as claimed in Claim 14 wherein the step of determining said warmup data comprised determining said warmup data by applying a computational algarythum to said parameter data.

16. A method as claimed in Claim 13 wherein the step of accumulating and storing parameter data comprises accumulating and storing parameter data representing use of said ink cartridge, and wherein said second conditions comprise temperature-related data and history-related data, and wherein the step of determining said warmup data comprises determining said warmup data dependent on said parameter representing use, said temperature-related data and said history-related data.

17. A method as claimed as Claim 13 comprising the additional step of entering a user-selected parameter into said apparatus, and wherein said second conditions comprise temperature-related data and user-related data, and wherein the step of determining said warmup data comprises determining said warmup data from said parameter entered by said user, said temperature-related data and said user-related data.

18. A method as claimed in Claim 13 comprising the step of operating said ink jet printhead with a voltage pulse having a pulse amplitude and a pulse duration, and comprising modifying said pulse amplitude in said warmup cycle and maintaining said pulse duration at a constant value during said warmup cycle, said constant value being shorter than a pulse duration when operating said ink jet printhead for printing.

19. A method as claimed in Claim 13 wherein said second conditions include temperature-related data, history-related data and user-related data, and comprising the additional steps of operating said ink jet print head with a voltage

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pulse having a pulse amplitude and a pulse duration, and modifying said pulse amplitude during said warmup cycle dependent on said temperature-related data and said history-related data, and modifying said pulse duration during said warmup cycle dependent on said user-related data.

20. A method as claimed in Claim 13 comprising the steps of:

uniquely allocating identification data to said ink cartridge;

before each use of said ink cartridge, interrogating said identification data and checking said identification data to authenticate said identification data; and

determining said warmup data for said for said fast start according to a first procedure if said ink cartridge is authenticated and according to a second procedure if said ink cartridge is not authenticated.

21. A method as claimed in Claim 13 wherein said second conditions comprise data representing ambient temperature, data representing temperature of said ink jet print head a first parameter dependent on use of said ink cartridge, and a user-entered second parameter indicating selection of a shortened warmup cycle.

22. A method as claimed in Claim 13 wherein said ink cartridge is a first ink cartridge, and comprising the additional steps of providing a second ink cartridge in said apparatus and determining different warmup data for said second ink cartridge, and operating said first ink cartridge in said warmup cycle with said warmup data and operating said second ink cartridge in said warmup cycle with said different warmup data.

23. A method as claimed in Claim 22 comprising operating said first ink cartridge with a first voltage pulse having a pulse amplitude and a pulse duration, and

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operating said second ink cartridge with a second pulse having a pulse duration and a pulse amplitude, and comprising compensating for differences between said first ink cartridge and said second ink cartridge by modifying, in said warmup cycle, said pulse duration of one of said first pulse and said second pulse, while maintaining said pulse amplitude of said first pulse and said second pulse equal.

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